

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for obtaining quality output signals from a chemical array image, said method comprising the steps of:
segmenting the chemical array image into regions, each region encapsulating a feature and surrounding background pixels, wherein the sum of the regions includes substantially all of the pixels of the chemical array image;
reading output signals from all pixels in a region;
rank ordering the output signals from the region ~~chemical array image~~ according to signal magnitude; and
identifying a subset of the rank ordered output signals which are ~~representative of the quality output signals~~, wherein locations of pixels in the region image from which the ~~identified quality output~~ signals are outputted can be located anywhere within the region geometrically independently of a presumed feature location.
2. (Canceled)
3. (Currently Amended) The method of claim 1 wherein the region ~~chemical array image~~ is subdivided into pixels, and each ranked output signal is a signal representing output from a pixel.
4. (Original) The method of claim 1, wherein said identifying a subset is performed using a filter.
5. (Currently Amended) The method of claim 1, wherein ~~the chemical array image is broken down in to subunits, and~~ coordinates of a location of each region ~~subunit~~ of the chemical array image are maintained with the signal values even after said rank ordering.
6. (Original) The method of claim 1, further comprising plotting the output signal magnitudes versus rank order numbers on a two-dimensional plot.
7. (Currently Amended) The method of claim 6, further comprising determining a slope of the plotted subset of the rank ordered output signals which are ~~representative of the quality output signals~~, and determining a relative quality of the subset of quality output signals based on said slope.

8. (Currently Amended) The method of claim 1, further comprising identifying a residue subset comprising a subset of the rank ordered output signals having magnitudes larger than the quality output signals subset.

9. (Original) The method of claim 1, further comprising identifying a background subset comprising a subset of the rank ordered output signals having the lowest magnitudes.

10. (Currently Amended) The method of claim 9, further comprising identifying a corona subset comprising a subset of the rank ordered output signals having transitional magnitude values between the values of said background subset and said subset having the ~~high~~ quality output signals.

11. (Original) The method of claim 5, further comprising identifying banding of subunits by comparing the rank order of the subunit signal outputs with said coordinates of the subunits.

12. (Previously Presented) The method of claim 11, further comprising producing diagnostics based on results of said identifying banding.

13. (Original) The method of claim 12, wherein said producing diagnostics includes at least one of estimating a radius of at least one of said subsets, and computing a radius of gyration of at least one of said subsets.

14. (Previously Presented) The method of claim 10, wherein said producing diagnostics includes at least one of calculating a mean, median or other estimate of signal values in at least one of said subsets, and calculating a standard deviation of signal values in at least one of said subsets.

15. (Currently Amended) The method of claim 9, further comprising subtracting an average signal value of said background subset from an average value of said subset having the representative of ~~the high~~ quality output signals.

16. (Original) The method of claim 5, wherein said steps are carried out for two channels or colors of subunits, said method further comprising comparing the output signals of the first channel to the second channel to check for misalignment of the channels.

17. (Currently Amended) The method of claim 1, wherein said steps are carried out for two channels or colors of signals, said method further comprising comparing signals between the two channels according to rank order, not physical location on the region ~~chemical array image~~.

18. (Original) A method comprising forwarding a result obtained from the method of claim 1 to a remote location.

19. (Original) A method comprising transmitting data representing a result obtained from the method of claim 1 to a remote location.

20. (Original) A method comprising receiving a result obtained from a method of claim 1 from a remote location.

21. (Original) The method of claim 1, wherein the chemical array image is taken from a microarray.

22. (Original) The method of claim 1, further comprising the steps of:
comparing an average signal value from a first predefined subset made up of the lowest signal values in the rank ordering with an average signal value from a second predefined subset made up of the high signal values in the rank ordering to determine whether a predefined signal difference level is present.

23. (Canceled)

24. (Canceled)

25. (Currently Amended) The method of claim 1 ~~23~~, further comprising iterating said reading and rank ordering steps for at least one additional region.

26. (Original) The method of claim 10, further comprising identifying two corona section locations to be used for comparison with two corona sections identified in a second channel of a two channel array, to check color alignment.

27. (Currently Amended) The method of claim 1 ~~23~~, further comprising locating a said grid to define said regions.

28. (Currently Amended) The method of claim 27 ~~26~~, wherein said locating comprises providing at least one mathematical probe to converge on the features of the array, calculating a distance

between features having been converged on, and calculating a size of said regions said size being sufficient to completely contain a single feature.

29. (Currently Amended) A geometrically independent method of selecting quality signals from a microarray feature region, without the use of a template, wherein the microarray feature region includes a feature surrounded by background region that separates the feature from other features on a microarray, said method comprising the steps of:

reading output signals over the entire surface of the feature region ~~a feature and over a predefined background region surrounding the feature~~;

maintaining coordinates of each location from where each output signal originated during said reading, in association with the read output signals;

rank ordering the output signals according to signal magnitude; and

identifying a subset of the rank ordered output signals which are ~~representative of the high quality output signals~~, wherein locations from which the subset of the high quality output signals originated can be anywhere in the feature or background region of the microarray feature region ~~are identified geometrically independently of the locations from which the high quality signals originated~~.

30. (Currently Amended) A system for obtaining quality signals from a chemical array image, said system comprising:

means for reading output signals from all pixels of a region, after segmenting the chemical array image into regions, each said region encapsulating a feature and surrounding background pixels, wherein the sum of the regions includes substantially all of the pixels of the chemical array image;

means for rank ordering the output signals from reading the region ~~chemical array image~~, according to signal magnitude; and

means for identifying a subset of the rank ordered output signals which are ~~representative of the quality output signals~~, wherein locations from which the subset of the quality rank-ordered output signals originated can be anywhere in the region ~~identified are identified geometrically independently of locations of pixels of the image from which the signals originated~~.

31. (Canceled)

32. (Canceled)

33. (Canceled)

34. (Original) The system of claim 30, further comprising means for maintaining coordinates of a location from which each signal originated on the chemical array image, in association with said output signals, even after said rank ordering.

35. (Original) The system of claim 30, further comprising means for plotting the output signal magnitudes versus rank order numbers on a two-dimensional plot.

36. (Currently Amended) The system of claim 30, further comprising means for identifying a residue subset comprising a subset of the rank ordered output signals having magnitudes larger than the quality output signals subset.

37. (Original) The system of claim 30, further comprising means for identifying a background subset comprising a subset of the rank ordered output signals having the lowest magnitudes.

38. (Currently Amended) The system of claim 37, further comprising means for identifying a corona subset comprising a subset of the rank ordered output signals having transitional magnitude values between the values of said background subset and said subset having the quality output signals.

39. (Original) The system of claim 34, further comprising means for identifying banding of signals by comparing the rank order of the signal outputs with said coordinates associated with the signals.

40. (Original) The system of claim 39, further comprising means for producing diagnostics based on results of said banding identification.

41. (Original) The system of claim 34, further comprising means for comparing said output signals with output signals of a second channel to check for misalignment of channels of a two channel system.

42. (Currently Amended) The system of claim 41, wherein said comparison is based upon rank order of the output signals of the two channels, not physical location of the pixels ~~subunits~~ on the region.

43. (Original) The system of claim 30, further comprising means for comparing an average signal value from a first predefined subset made up of the lowest signal values in the rank ordering with an average signal value from a second predefined subset made up of the high signal values in the rank ordering to determine whether a predefined signal difference level is present.

44. (Original) The system of claim 38, further comprising means for identifying two corona section locations to be used for comparison with two corona sections identified in a second channel of a two channel array, to check color alignment.

45. (Currently Amended) The system of claim 30, further comprising means for locating a grid to define said regions on the chemical array image, each region designed to include a feature, and wherein said means for rank ordering and means for identifying process the chemical array image a region at a time.

46. (Currently Amended) A computer readable medium carrying one or more sequences of instructions for obtaining quality output signals from a chemical array image, wherein execution of one or more sequences of instructions by one or more processors causes the one or more processors to perform the steps of:

reading output signals from all pixels in a region, said chemical array image having been segmented into regions, each said region encapsulating a feature and surrounding background pixels, wherein the sum of the regions includes substantially all of the pixels of the chemical array image;

rank ordering the output signals according to signal magnitude; and

identifying a subset of the rank ordered output signals which are ~~representative of~~ the quality output signals, wherein locations from which the subset of the quality rank-ordered output signals originated can be anywhere in the region ~~identified are identified geometrically independently of locations of pixels of the image from which the identified signals originated.~~

47. (Canceled)

48. (Currently Amended) The computer readable medium of claim ~~46~~ 47 wherein each region is subdivided into pixels subunits, each said output signal being associated with one of said pixels subunits, respectively.

49. (Canceled)

50. (Original) The computer readable medium of claim 46 wherein coordinates of locations on the chemical array image from where said output signals were produced are maintained with the signal values even after said rank ordering.

51. (Original) The computer readable medium of claim 46, wherein execution of one or more sequences of instructions by one or more processors causes the one or more processors to perform the further step of: plotting the output signal magnitudes versus rank order numbers on a two-dimensional plot.

52. (Previously Presented) A method for obtaining quality output signals from a chemical array image, said method comprising the steps of:

rank ordering the output signals from the chemical array image according to signal magnitude;
plotting the output signal magnitudes versus rank order numbers on a two-dimensional plot;
determining a slope of the plotted subset of the rank ordered output signals which are representative of the quality signals, thereby identifying a subset of the rank ordered output signals which are representative of the quality signals; and
determining a relative quality of the subset of quality signals based on said slope.

53. (Previously Presented) A method for obtaining quality output signals from a chemical array image, said method comprising the steps of:

rank ordering the output signals from the chemical array image according to signal magnitude, wherein the chemical array image is broken down in to subunits, and coordinates of a location of each subunit of the chemical array image are maintained with the signal values even after said rank ordering;
identifying a subset of the rank ordered output signals which are representative of the quality signals;

identifying banding of subunits by comparing the rank order of the subunit signal outputs with said coordinates of the subunits; and

producing diagnostics based on results of said identifying banding, wherein said producing diagnostics includes at least one of estimating a radius of at least one of said subsets, and computing a radius of gyration of at least one of said subsets.

54. (Previously Presented) A method for obtaining quality output signals from a chemical array image, said method comprising the steps of:

rank ordering the output signals from the chemical array image according to signal magnitude, wherein the chemical array image is broken down into subunits, and coordinates of a location of each

subunit of the chemical array image are maintained with the signal values even after said rank ordering;
and

identifying a subset of the rank ordered output signals which are representative of the quality signals;

wherein said steps are carried out for two channels or colors of subunits, said method further comprising comparing the output signals of the first channel to the second channel to check for misalignment of the channels.

55. (Previously Presented) A method for obtaining quality output signals from a chemical array image, said method comprising the steps of:

rank ordering the output signals from the chemical array image according to signal magnitude;
and

identifying a subset of the rank ordered output signals which are representative of the quality signals, wherein said steps are carried out for two channels or colors of signals, said method further comprising comparing signals between the two channels according to rank order, not physical location on the chemical array image.

56. (Previously Presented) A method for obtaining quality output signals from a chemical array image, said method comprising the steps of:

rank ordering the output signals from the chemical array image according to signal magnitude;
identifying a subset of the rank ordered output signals which are representative of the quality signals;

identifying a background subset comprising a subset of the rank ordered output signals having the lowest magnitudes; and

identifying a corona subset comprising a subset of the rank ordered output signals having transitional magnitude values between the values of said background subset and said subset having the high quality signals; and

identifying two corona section locations to be used for comparison with two corona sections identified in a second channel of a two channel array, to check color alignment.

57. (Previously Presented) A system for obtaining quality signals from a chemical array image, said system comprising:

means for rank ordering the output signals from reading the chemical array image, according to signal magnitude;

means for identifying a subset of the rank ordered output signals which are representative of the quality signals;

means for identifying a background subset comprising a subset of the rank ordered output signals having the lowest magnitudes;

means for identifying a corona subset comprising a subset of the rank ordered output signals having transitional magnitude values between the values of said background subset and said subset having the quality signals; and

means for identifying two corona section locations to be used for comparison with two corona sections identified in a second channel of a two channel array, to check color alignment.